

# Membrane Activities

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- Diagram Matching  $\Rightarrow$  27 points

- CW Puzzle  $\Rightarrow$  20 points

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Activity

47

points

Total  
possible

points

your  
total

# Membranes

Directions: Each diagram set should be used to complete the following paragraphs. Use the word bank to identify all diagram parts & the missing words in the paragraphs. Some words are used more than once, some blanks are listed in the wordbank but NOT lettered in the diagrams.

## Word bank

Alpha-Helix  
Attachment  
Carbohydrate(s)  
Cholesterol  
Connect  
Cytoskeleton  
Cytosol  
Enzymes  
Extracellular  
Fluid  
Fatty Acid(s)  
Fluid  
Glycolipid  
Glycoprotein

Glycerol  
Hydrophillic  
Hydrophobic  
Inside  
Integral  
Protein  
Non-Polar tails  
Outside  
Peripheral  
protein  
Phosphate  
Phospholipid(s)  
~~Phospholipid~~  
Polar head(s)  
Recognition

Saturated  
Transport  
Unsaturated  
Viscous

### Figure 1

The building block of all membranes is the (D) \_\_\_\_\_. This figure shows all the atoms that make up these building blocks. There are 3 main parts including a (A) \_\_\_\_\_ group, a (B) \_\_\_\_\_ molecule, and 2 (C) \_\_\_\_\_ tails. When many phospholipids aggregate, they form a bilayer that excludes water from their hydrophobic fatty acid tails. The phospholipid bilayer shown here has all (E) \_\_\_\_\_ fatty acids and would therefore have a fairly \_\_\_\_\_ texture. On the other hand, if the fatty acids were \_\_\_\_\_ the texture would be more \_\_\_\_\_.

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### Figure 2

Similar to figure 1, the phospholipid bilayer is shown but it does not show all the actual atoms. For convenience, most diagrams represent the phosphate group as a sphere with the 2 fatty acid tails dangling off. The phosphate head is also called the (A) \_\_\_\_\_ and the fatty acids are called the (B) \_\_\_\_\_. When shown as a whole membrane, the outside regions associate with water and are considered (C) \_\_\_\_\_ but the inside regions keep away from water and are considered (D) \_\_\_\_\_.

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### Figure 3

This diagram shows an entire cell that has been “sliced open” to show the membrane. Using the cell as a frame of reference, there are 2 liquids to consider. Inside the cell is the (A) \_\_\_\_\_ and the (B) \_\_\_\_\_. \_\_\_\_\_ surrounds the cell. Region D would be considered \_\_\_\_\_ and the 2 C regions \_\_\_\_\_ since they face some type of fluid containing water. These 2 layers of (E) \_\_\_\_\_ are the basis for all life because cells could not exist without membranes!

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### Figure 4

This diagram shows a cross section of a membrane. Letter A represents the \_\_\_\_\_ bilayer. You should be able to tell where the inside of the cell is based on the location of fibers of the (E) \_\_\_\_\_. The outside of the cell shows many different proteins in and on the membrane. Proteins with chains of carbohydrates attached are called (F) \_\_\_\_\_. Other proteins are located only on the outside of the membrane and are called (C) \_\_\_\_\_. Finally, there are some proteins that traverse the membrane, providing a bridge between the inside and outside of the cell. These are called (B) \_\_\_\_\_. Letters B

and C represent the same protein but C shows the secondary structure called an \_\_\_\_\_. Other important molecules are located in or on the membrane as well. Letter G shows a carbohydrate attached to part of a phospholipid. This is called a \_\_\_\_\_. Another type of lipid that affects the membrane texture is (D) \_\_\_\_\_. The functions of different proteins vary. Some function in the \_\_\_\_\_ of materials in and out of cells. Others \_\_\_\_\_ different cells together. Some serve as points of \_\_\_\_\_ for the cytoskeleton & ECM. The carbohydrates on glycoproteins & glycolipids are important for cell-cell \_\_\_\_\_. Finally, many proteins aid in chemical reactions as \_\_\_\_\_.

Figure 5 - 7

5.

These diagrams are almost exactly the same as figure 4. Letter E shows the \_\_\_\_\_ - \_\_\_\_\_ and letter I shows the \_\_\_\_\_. Try to identify the other letters:

A. _____	B. _____
C. _____	D. _____
F. _____	G. _____
H. _____	

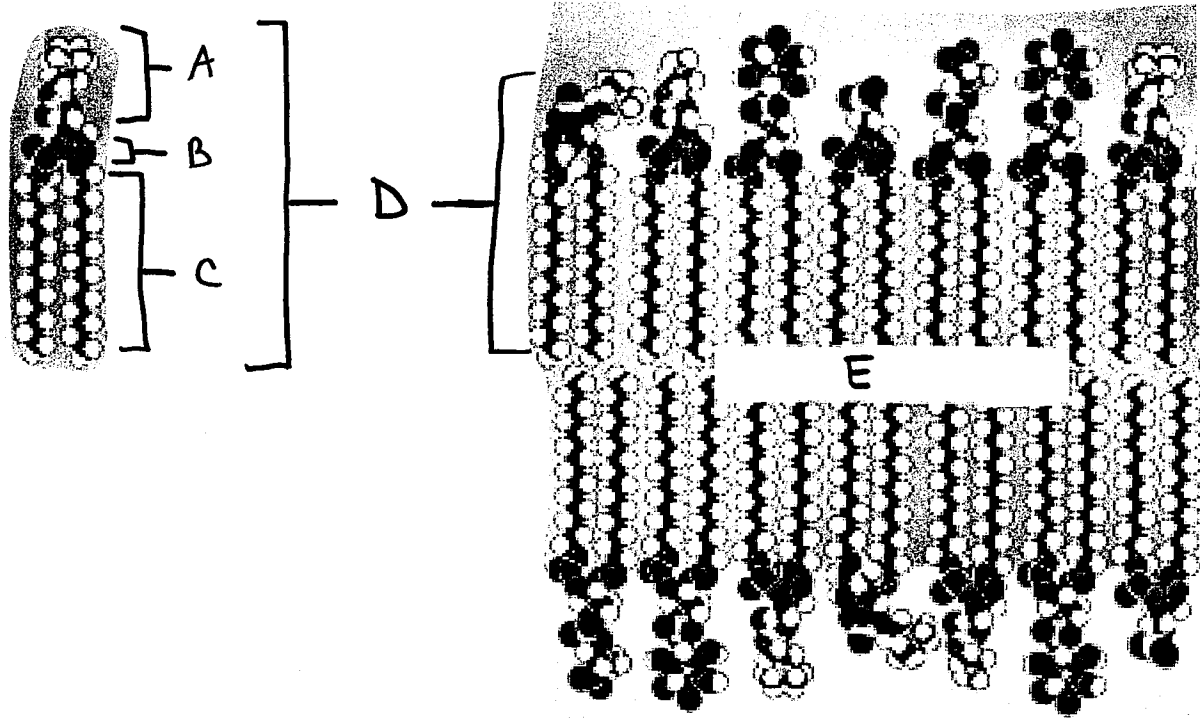
6.

A. _____	B. _____
C. _____	D. _____
E. _____	F. _____
G. _____	H. _____
I. _____	

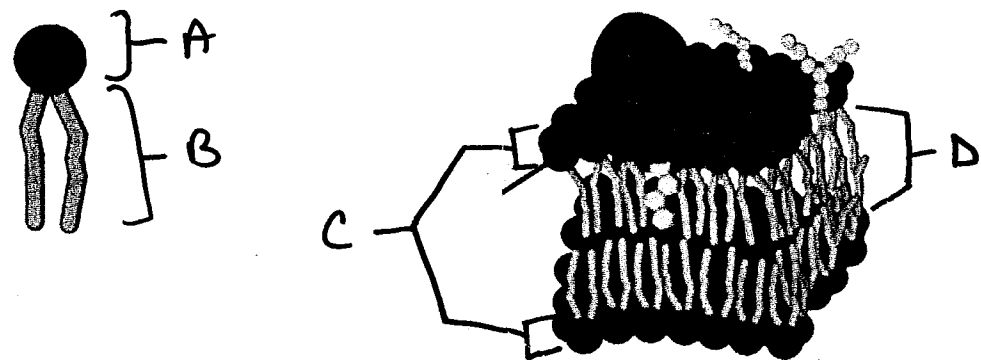
7.

A. _____	B. _____
C. _____	D. _____
E. _____	F. _____

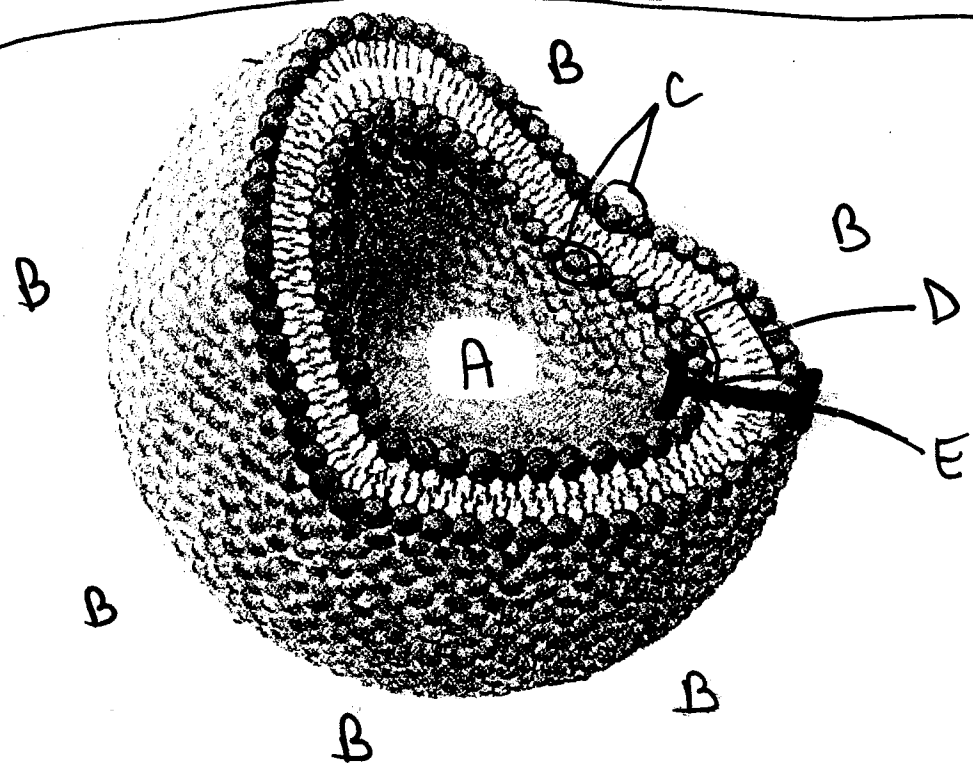
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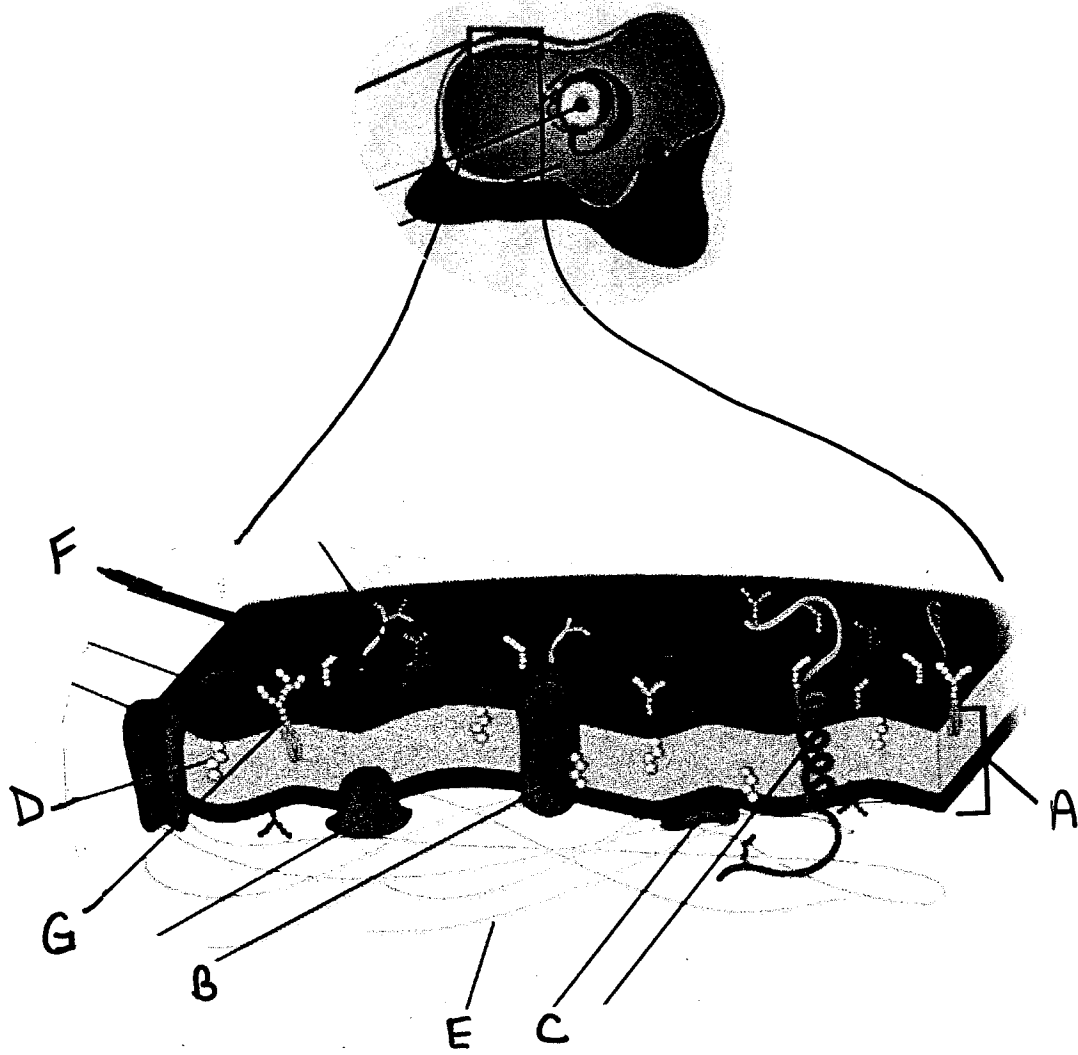
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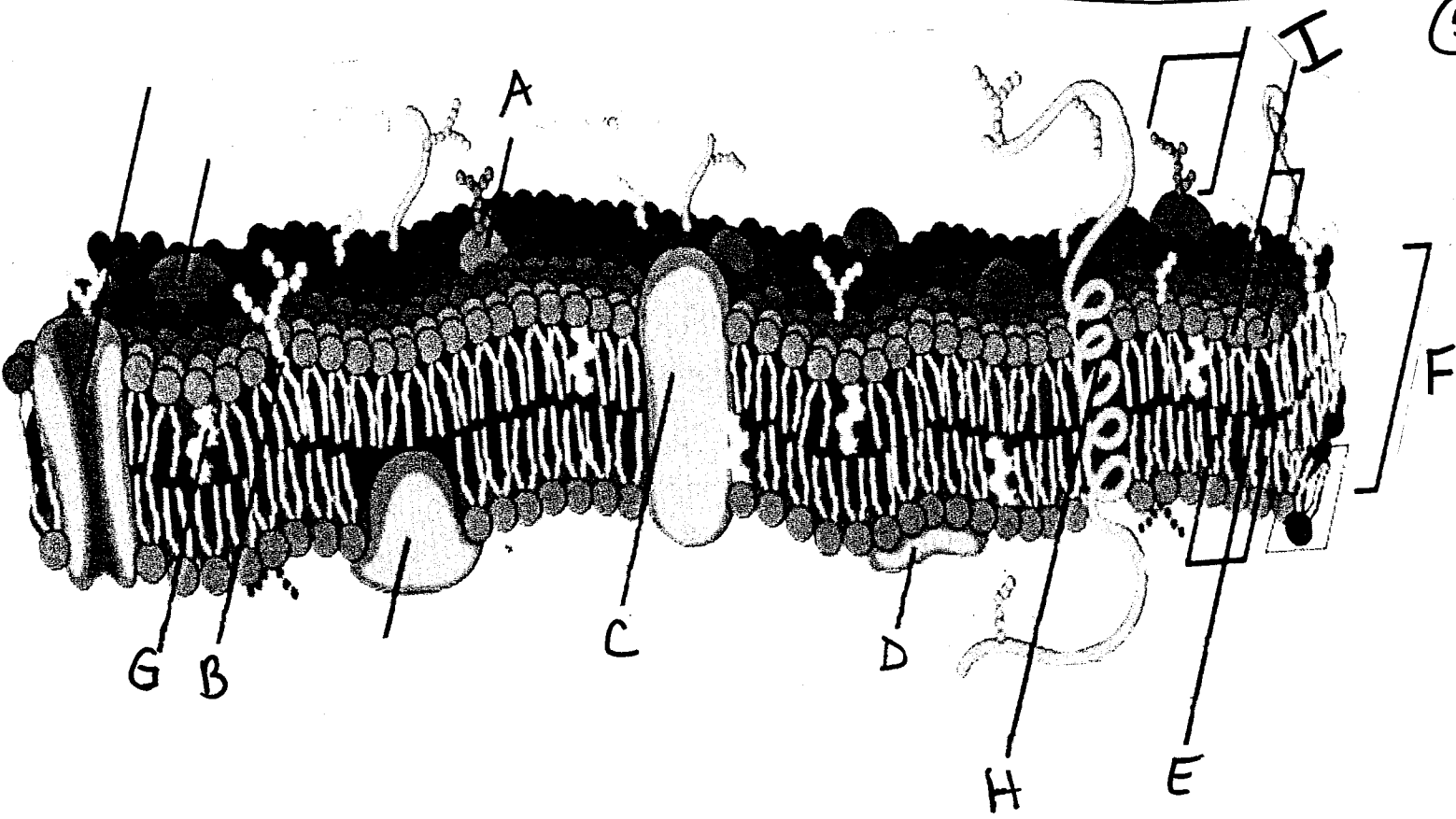
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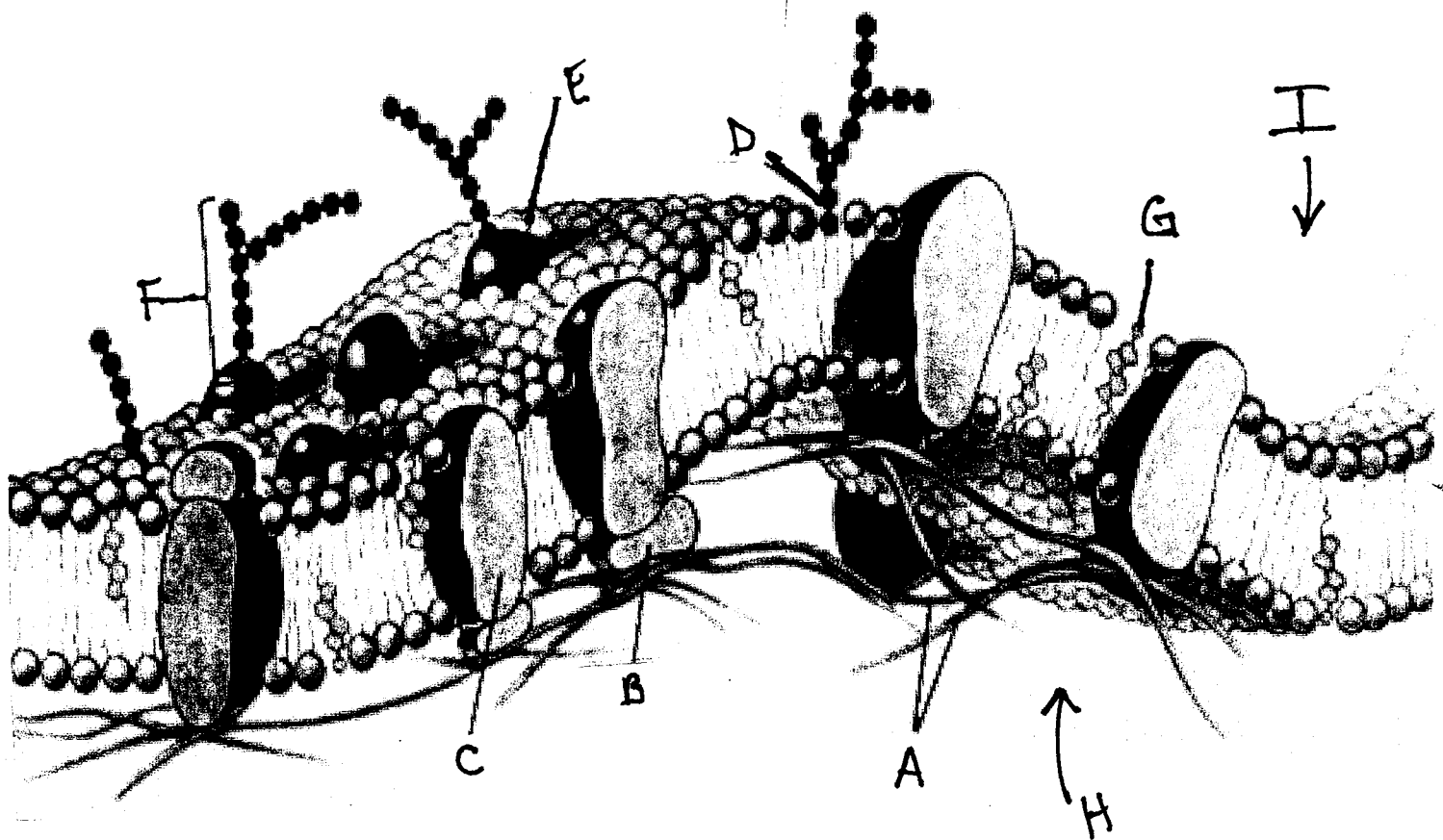
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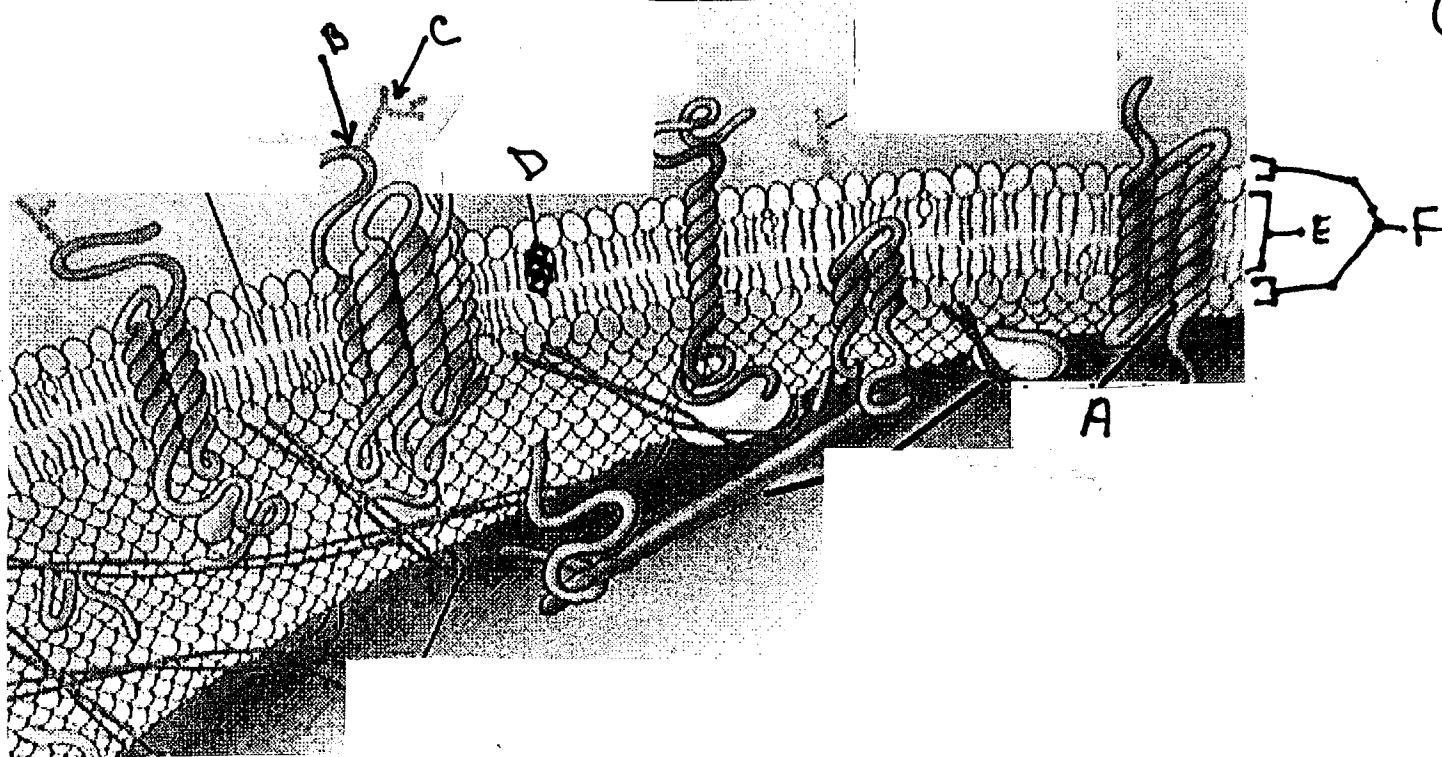
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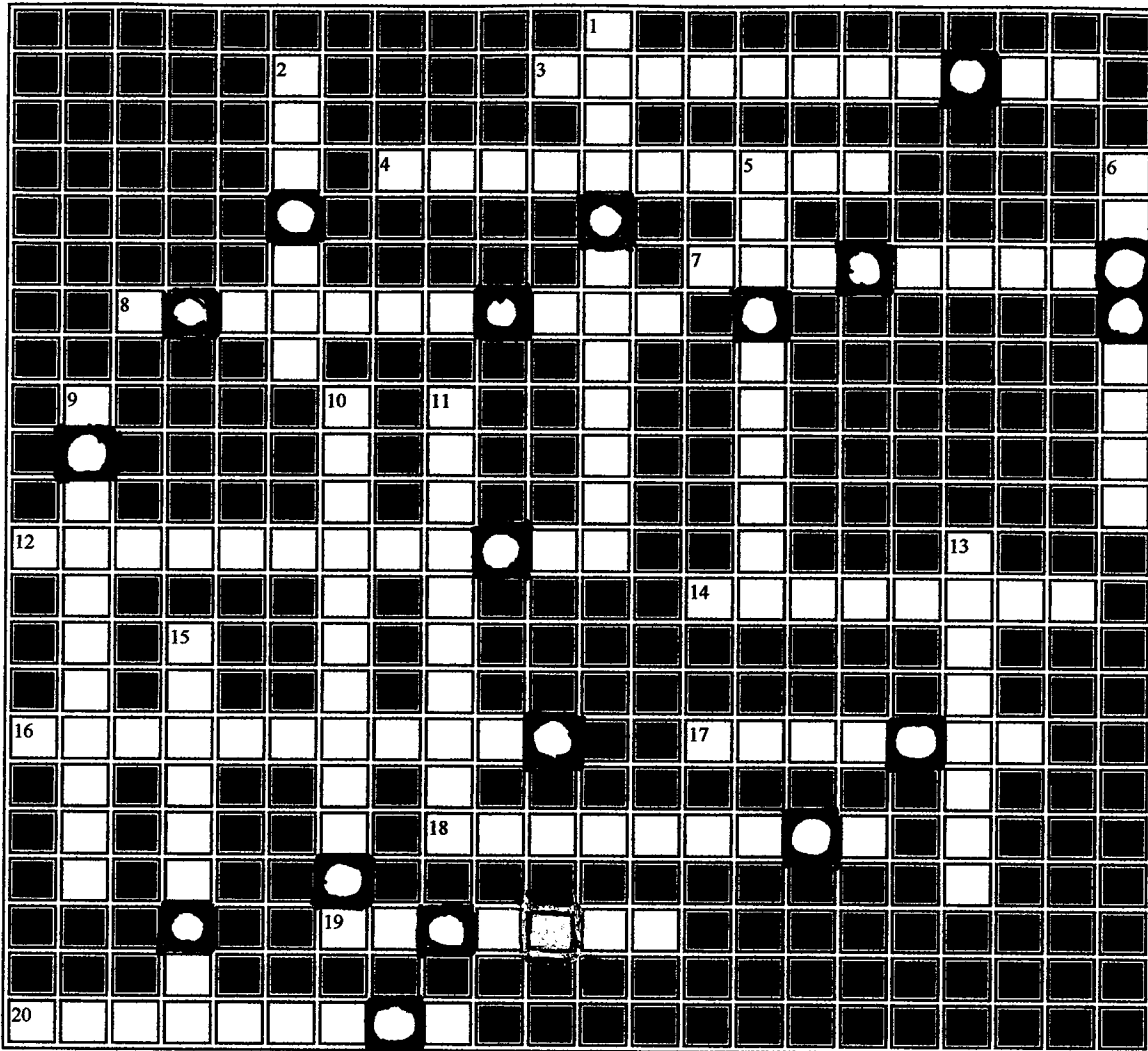
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# Membranes!

Miss Passamonti- AP Biology

Use the clues to complete the following puzzle.



## Across

3. The fatty acid tails are considered this.
4. Lipids with carbohydrates attached.
7. Important role of integral proteins.
8. A membrane with many of these fatty acids would be fluid.
12. Proteins with carbohydrates attached.
14. A rare type of phospholipid movement.
16. Important role of carbohydrates associated with membranes.
17. Important function of many membrane proteins.

## Down

1. Parts of this attach to proteins.
2. Side to side phospholipid movement.
5. These proteins are only outside of membranes.
6. These proteins traverse or are in the membrane.
9. A molecule found inside the bilayer that makes it more fluid. ↗ of animals!
10. Phosphate heads are considered this.
11. These parts of a phospholipid are non-polar

2-word answers don't have a space between them!

Some words are plural!



18. A membrane with these fatty acids would be very viscous.

19. Proteins of 2 different cell membranes can \_\_\_\_\_ the 2 cells.

20. Membrane proteins can act as these when they respond to chemical signals.

13. The molecule in between the phosphate and the fatty acid tails.

15. This part of a phospholipid is polar.

Extra Credit!! - 5 points

The puzzle has some squares outlined. Use the letters in these squares to solve the riddle:

Q: Why did the phospholipid punch the psychiatrist?

A: The psychiatrist said he was

□ □ □ □ □ □ □ □ □ □

□ □ M □ □ □ □ □ !